

Climate-U

Transforming Universities
for a Changing Climate

**Higher Education
Climate Action:
The Case of Kenyatta
University**

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and Innovation**



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Changing Climate
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Abstract

Climate change is the most significant issue affecting societies in the contemporary era. Globally, countries and the international community have recognised the importance of using higher education to address climate change since it provides a platform for learners to engage in in-depth learning in a specific discipline. Higher education can significantly prepare societies for global changes by creating awareness of emerging issues and advocating behavioural change. Universities are introducing degree programmes and subcomponents focusing on climate change. This study's main aim was to assess the extent to which climate change content is covered in Kenyatta University curricula and campus greening activities and to examine collaborations and partnerships between the university and external organisations on climate action. Additionally, the study examined opportunities and challenges in the university's involvement in climate action. The study relied on a case study design to ascertain the extent of climate change content coverage in the university's traditional teaching, research and community engagement roles. Purposive sampling was utilised to select respondents. Respondents included deans of schools (faculties) at Kenyatta University and policymakers from external organisations. A total of 16 respondents participated in the study. Data was collected using semi-structured interviews. A review of education and policies provided additional secondary data. Thematic analysis was used to identify recurring themes and patterns in the data. Findings reveal that some schools have incorporated climate change content into their programmes. Most campus greening activities are implemented by student clubs domiciled in their respective schools. Kenyatta University has several related collaborations and partnerships to strengthen the institution's involvement in climate action. This study recommends enhancing existing and instituting new collaborations to develop appropriate courses on climate change, expand research and enhance student and community engagement to bolster sustainability in development projects.



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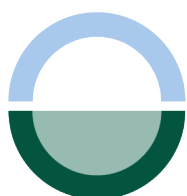


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1.0 Introduction

The impacts of climate change affecting societies include warming and rising sea level, prolonged droughts, sporadic and unpredictable precipitation, floods, high temperatures, heatwaves and biodiversity deterioration (IPCC, 2022; Mangizvo et al., 2015; Otieno, 2010). Developing countries, especially those in Sub-Saharan Africa (SSA), will likely experience more devastation due to climate change (Maino & Emrullahu, 2022). Most countries in SSA are highly dependent on agriculture that faces climate change challenges of drought, desertification, massive flooding and increased pest damage due to changes in ecological conditions. Climate change impacts will cause decreased food production, destabilise local markets and limit the countries' economic growth (Ray, 2021). Warmer temperatures and increased precipitation will increase the geographical distribution of insects such as mosquitoes leading to a significant increase in outbreaks of dengue fever, yellow fever and malaria (UNFCCC, 2020). Jafino et al. (2020) note that climate change will push more than 39 million people in SSA into poverty if sustainable climate action is not implemented by 2050. Moreover, climate change will result in conflicts over the scarcity of ecological resources. African countries face weak governance and a lack of adequate financial and technical resources that limits their efforts to address the climate crisis, increasing their vulnerability to the menace (Maino & Emrullahu, 2022). As the challenges of climate change become more evident in SSA, international actors such as the United Nations Environment Programme (UNEP) and local governments call for participatory climate action efforts.

One of the stakeholders expected to take centre stage in addressing climate change are global higher education institutions (HEIs), especially universities. Research, teaching and opportunities for community engagements make the universities best suited to increase climate literacy (Mangizvo et al., 2015). Literacy refers to the capability of identifying, comprehending, interpreting, creating, communicating, computing and using printed and written resources (Miler & Sladek, 2011). Thus, climate literacy refers to the ability of an individual to understand the climate's influences on themselves and society (Miler & Sladek, 2011). Simpson et al. (2021) state that climate literacy entails being aware of the climate change phenomenon and its anthropogenic causes that inform mitigations and adaptation responses. Therefore, a climate-literate person comprehends the fundamental principles of all earth's systems governing climatic patterns. The individual possesses the capability to gather climate and weather information, disseminate the information and make scientifically informed and responsible decisions about climate-related matters.

University education determines graduates' knowledge and professional skills that could support collaborative development and positively influence decision-makers (Moussa & Abdoul-Azize, 2021). Thus, universities can promote sustainable development due to their paramount role in knowledge production, training researchers, and partnerships (Mangizvo et al., 2015). In addition, universities shape community culture and individual values, beliefs and assumptions (Mangizvo et al., 2015). Several scholars



promote sustainable development due to their paramount role in knowledge production, training researchers, and partnerships (Mangizvo et al., 2015). In addition, universities shape community culture and individual values, beliefs and assumptions (Mangizvo et al., 2015). Several scholars have advocated for the infusion of climate change education (CCE) content into university curricula across all faculties and disciplines as a significant step in creating climate literacy (Beck et al., 2013; Chakeredza et al., 2009; Mangizvo et al., 2015). Since the learners are community members, climate literacy will likely cascade down to the society members. Vogel et al. (2015) point out knowledge domains linked to sustainability, including climate change, which calls for a transformative shift in how humankind 'thinks' and 'feels.' CCE allows learners to change their attitudes, perspectives and adopt sustainable behaviours. The ability of universities to shape climate-literate learners will empower the communities to engage in climate action to strengthen their resilience and adaptive capacity to climate change.

2.0 Africa's Higher Education Climate Action Efforts

Past research on African higher education reveals that few universities have begun developing CCE programmes that include single courses, research, innovations and community interventions (Leal Filho, 2015). For example, Eduardo Mondlane University in Mozambique, Stellenbosch University, University of Cape Town and University of Vender in South Africa, Pan African University in Cameroon, Makerere University in Uganda, Sokoine University and University of Dar es Salaam in Tanzania, University of Zimbabwe and University of Tlemcen in Algeria have developed courses on climate change-related content (Ssekamatte, 2022). In addition, the Pan African University Institute for Water and Energy Sciences (PAUWES) offers two postgraduate programmes, a master's in water and a master's in energy, that expose students to the globe's most pressing challenges, including climate change (United Nations University, n.d). PAUWES aims to graduate a new generation of young scholars who are highly educated and committed to assisting African communities in addressing climate change.

Initiatives such as the Education, Capacity Building, and Climate Change: A Strategy for Collective Action in Africa and Programme for Climate Change Capacity Development (PCCCD) have been initiated in the past to support African universities in strengthening their role in climate action (Leal Filho et al., 2019). The Education, Capacity Building, and Climate Change: A Strategy for Collective Action in Africa was a four-day forum held by the International START Secretariat and held in Dar es Salaam in June 2010 (Padgham et al., 2013). During the summit, universities and members penned down several short-term and long-term measures to initiate effective university curriculum development, including climate change content (Padgham et al. (2013). On the other hand, PCCCD was created by the Southern African Universities Association (SARUA) and its member universities in 2010 (Leal Filho et al., 2019). During the PCCCD, a consortium involving seven universities developed a standard regional climate change and sustainable development plan grounded in innovation, emerging knowledge, and inter and

trans-disciplinary approaches (Leal Filho et al., 2019).

The other vital efforts to underpin higher education in Africa to tackle emerging issues like climate change include the Mainstreaming Environment and Sustainability in African Universities (MESA) project (Ndegwa, 2018). MESA is a United Nations' environment initiative with African universities to strengthen the UN Decade of Education for Sustainable Development (UNDESD) (UNEP, n.d). MESA's primary objective is mainstreaming environment and sustainability content into teaching, research, community engagement and management in African universities. Ndegwa (2018) explains that MESA was crucial in supporting African universities by developing several approaches to respond to the Millennium Development Goals (MDGs). MESA supported the African universities in realising the set targets of the New Partnership for African Development (NEPAD) and the African Ministerial Conference on Environment (AMCEN). One of NEPAD's themes is climate change and natural resource management. Through the theme, universities and other relevant actors in the continent are tasked with assisting communities in developing mitigation and adaptations to climate change. On the other hand, AMCEN's primary role is advocating for ecological protection in Africa to meet human needs and ensure sustainable socio-economic growth.

UNEP's Environmental Education and Training Unit (EETU) collaborates with several African higher education institutions through the Global Universities Partnership on Environment and Sustainability (GUPES). The partnerships' primary purpose was to incorporate environmental and sustainability aspects into higher education teaching and learning, university-community engagement and university management (Ndegwa, 2018). The partnerships between UNEP and the higher education institutions also focused on greening universities' infrastructure and involving learners in collaborative climate actions. Over the years, the African Union (AU) and NEPAD have championed the transformation of higher education centres as 'development universities' with adequate capacity to address international and local challenges (UNEP, n.d). Franco et al. (2018) note that the shift of higher education to include sustainable development concepts and policies is needed across the globe to ensure that higher education aligns with the world's sustainability efforts.

However, despite the prominence of higher education in providing solutions to climate change and efforts to mainstream climate change in the curriculum, universities, especially in SSA, are not fully or actively engaged in climate action (Mangizvo et al., 2015; Moussa & Abdoul-Azize, 2021; Padgham et al., 2013). An analysis of 15 HEIs in West Africa reveals that although the institutions have climate change curricula, the content incorporated fails to provide research-based skills to the students to carry out scientific explorations on societal climate change-related challenges (Moussa & Abdoul-Azize, 2021). Students conduct limited mandatory research in the 15 HEIs to meet the graduation requirements. Moussa and Abdoul-Azize (2021) highlight lack of well-grounded research by HEIs reduces the ability of educational institutions to provide practical solutions to address the climate crisis.

Additionally, climate change has been termed as a difficult phenomenon to teach due to the incorporation of other complex aspects such as global warming, precipitation changes and weather in CCE (Yli-Panula et al., 2022). CCE is an emerging concept that lacks well-established teaching structures (Yli-Panula et al., 2022). Lecturers may fail to understand the purpose and goals of teaching CCE. Most CCE teaching and learning resources are outdated and may fail to provide sound scientific information (Melia, 2019). Thus, HEIs may provide misleading climate information that may fail to transform students to change agents of multiplier climate change awareness. Moreover, past research reveals that some lecturers have low experience, expertise and capacity to teach content on climate change (Ingwe et al., 2010). Thus, universities shy away from infusing climate change into their curriculum due to a lack of experienced lecturers to take the students through the teaching and learning process. Padgham et al. (2013) state that failure by universities to mainstream climate change content in their curriculum prevents them from actively participating in the community transformative change of creating ideal living spaces.

3.0 Kenyan Universities' Climate Action Initiatives

In Kenya's higher education, content on climate change is mainly offered through environmental education courses (Kariaga et al., 2013). Some Kenyan universities offer environmental programmes that integrate climate change content at the undergraduate and postgraduate levels. The traditional courses of agriculture, environmental and natural resources management, geography, geology and meteorology are offered at Egerton University, Moi University, Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenyatta University, Maseno University, United States International University (USIU) and University of Nairobi (UoN) mainstream 'some climate change related content' (Kariuki et al., 2016, p. 39). Several East African Community (EAC) universities have 'attempted' to integrate climate change content into specific postgraduate disciplines (EAC, 2011, p. 39). Kenyatta University School of Environmental Studies offers a master's and Ph.D. level climate change course, climate change and sustainability (CNRD, n.d). UoN's meteorology department offers an executive course on climate change adaptation and mitigation (Kariuki et al., 2016). Specific courses in the executive course, such as Climate Change and Renewable Energies, complement traditional ones like climatology and climate dynamics that mainstream climate change content.

Furthermore, the Education for Sustainable Development in Africa (ESDA) project and the MESA network guided Kenyan universities to integrate content on environmental sustainability, including climate change. ESDA project's main aim was to 'shed light on the readiness of African universities to engage in graduate-level capacity building in sustainable development' (Nyerere et al., 2021, p. 180). ESDA's master's level course on Sustainable Urban Development (SUD), which is field-oriented and provides problem-solving skills to the students, is jointly

offered at UoN and Kenyatta University (Nyerere et al., 2021). The SUD programme equips students with the knowledge and skills to address sustainable development challenges triggered by rapid urban population growth. Through MESA, six Kenyan universities have been empowered to create awareness of sustainable environmental protection, development, and societal well-being at the institutional and community levels (Kariaga et al., 2013).

In 2012, deliberations between UNEP's Environmental Education and Training Unit (EETU), the Greening Kenya Initiative (GKI), World Student Community for Sustainable Development (WSCSD), Multimedia University of Kenya (MMU), JKUAT and UoN resolved to establish the Kenya Green University Network (KGUN) (KGUN, 2014). KGUN is a higher education institution networking system that aims to integrate low-carbon climate-resilient development strategies and environmental and sustainability issues in campus activities (KGUN, 2021). KGUN also allows participating universities to participate in global conferences and ratify resolutions like the Paris Agreement on climate change (UNEP, 2016). Some Kenyan universities have also developed institutional policies to guide their operations toward sustainability agendas. Moreover, the institutional policies will play a crucial role in guiding the universities to comply with environmental laws and reduce their carbon and ecological footprints. For example, JKUAT has an Education for Sustainable Development (ESD) Policy to guide its practices. JKUAT's efforts to support its environmental courses were strengthened by the support from the Environmental Programme Support (EPS) with funding from the Swedish International Development Cooperation Agency (SIDA) and the Danish Development Agency (DANIDA) (Kariaga et al., 2013).

This study sought to establish Kenyatta University's climate actions by examining its teaching, research, community action and greening approaches. Opportunities available for the university to strengthen its climate action and challenges faced in combating climate change were also covered. This case study builds on the Transforming Universities for a Changing Climate objective of assessing existing coverage of climate change in universities' traditional roles in all the participating universities in the project.

4.0 Aim of the Study

The case study forms part of the ongoing research project Transforming Universities for a Changing Climate (Climate-U), which started in 2020. The research project recognises that universities have an essential role in contributing to global mitigation and adaptation efforts beyond their established work in climate research or climate-change-focused curricula (Climate-U, 2021). The main aim of this study was to assess the extent of climate change content covered in the Kenyatta University curriculum and its campus greening activities. Collaborations and partnerships that exist between the university and external organisations on climate action were examined during the study. Additionally, the study



examined opportunities and challenges the university encounters to strengthen its involvement in climate action.

The following research questions guided the study:

1. How and to what extent is climate change addressed in Kenyatta University curricula and campus activities?
2. Which forms of collaboration exist between universities and external stakeholders on climate change?
3. Which opportunities exist for Kenyatta University to contribute to climate action?
4. What are the obstacles hindering the university's effort in climate action?

5.0 About Kenyatta University

Kenyatta University is located along the Nairobi-Thika Highway in Nairobi City. The university covers 1100 acres of land. The institution was established following the British government's handover of the Templer Barracks to the Kenyan government (Ngundo, 2012). It started as Kenyatta College, specialising in teacher education. In 1970, the college became a constituent institute of the University of Nairobi through the Act of Parliament. The University received a fully-fledged status on August 23rd, 1985.

The University envisions *"a dynamic, an inclusive and competitive centre of excellence in teaching, learning, research and service to humanity"* (Kenyatta University, 2022a). Kenyatta University has grown from the first school of education to several schools such as Agriculture and Enterprise Development, Architecture and the Built Environment, Business, Creative and Performing Arts, Film and Media Studies, Virtual and Open Learning, Economics, Engineering and Technology, Environmental Studies, Graduate School, Hospitality Tourism and Leisure Studies, Humanities & Social Sciences, Law, Medicine, Nursing, Pharmacy, Public Health and Applied Human Sciences, Security, Diplomacy and Peace Studies, and Pure and Applied Sciences (Kenyatta University, 2022a). The University has expanded its education services and set up campuses in Nairobi City, Parklands, Mombasa, Nakuru, Embu, Kitui and Kiambu Counties (Kenyatta University, 2021a).

6.0 Sampling, Data Collection and Data Analysis

A case study design was adopted to guide the research. A case study is a research design that is useful to utilise when a researcher wants to acquire well-grounded, concrete and contextual information or knowledge about an event, issue or phenomenon (Crowe et al., 2011). Thus, the central tenet of a case study design is generating a multi-faceted and in-depth understanding of issues

in a real-life context. A case study approach was also utilised to develop a systematic understanding of how climate change is represented in the Kenyatta University curricula and campus activities. The study also assessed gaps that need to be addressed to achieve the full potential of Kenyatta University in responding to climate change through teaching, research and community service.

Sampling techniques in qualitative research do not adhere to probabilistic approaches but rather conform to naturalistic techniques (Kelly, 2010). Therefore, purposive sampling was used to select the respondents. Purposive sampling is a technique widely used in qualitative research to identify and select respondents likely to yield appropriate and valuable information (Kelly, 2010). Palinkas et al. (2015) note that purposive sampling in qualitative study's primary purpose is to increase the depth of information generated instead of breadth. In purposive sampling, the researcher uses a series of eligibility criteria to define the respondents and select ones who are knowledgeable or experienced about the research phenomenon (Kelly, 2010).

The selection of the respondents was based on the relevance of the positions they hold that relate to academic activities, student engagements and influence on policy. Deans were identified as key respondents to assess the extent of each school's coverage of climate change content in the curriculum, campus operations and community engagement. Data collection was undertaken before the merging of schools due to the ongoing reforms at the university. The merger reduced the number of schools from 17 to 7. Carrying out the study before merging the schools presented an opportunity to involve more respondents. Thus, the merge did not affect the data collection as rich information about the research phenomenon was already collected from the respondents.

Eleven deans from the schools of Agriculture and Enterprise Development; Architecture and Built Environment; Economics; Education; Engineering and Technology; Environmental Studies; Humanities and Social Sciences; Hospitality, Tourism and Leisure Studies; Law, Medicine and Pure and Applied Sciences were interviewed before the merger. However, four deans from the school of Business; Creative and Performing Arts, Film and Media Studies; Public Health and Security, Diplomacy and Peace Studies were not interviewed as the merger had already commenced before data collection. In addition, a respondent from Kenyatta University Centre for International Programmes and Partnerships was selected to participate in the study to provide insights into existing university partnerships and collaborations in climate action. Four respondents from government agencies that included the Climate Change Directorate (CCD), National Environmental Management Authority (NEMA), National Research Fund (NRF) and State Department of University Education and Research, were purposively selected to take part in the study. Thus, data was collected from 16 respondents.

Semi-structured interviews were utilised to gather data from the 16 respondents within and outside the university between June and October 2022. Semi-structured interviewing is a data collection

method guided by a set of pre-determined questions or topics with follow-up questions, comments and probes (Dejonckheere & Vaughn, 2019). The researcher modifies the sequencing of the questions and topics to best fit the interview context and interviewee. Furthermore, semi-structured interviews are carried out through face-to-face interactions and mediums such as emails or telephone (Ruslin et al., 2022). Therefore, face-to-face semi-structured were best fit primary data collection instruments in this study due to their ability to allow respondents to express their viewpoints in an openly designed interview context. Follow-up questions brought forward during the interview process allow the researcher to comprehend more about the research issue and collect factual data. Semi-structured interview schedules used to collect data are attached in appendix I and II.

Four deans from the school of Economics, Education, Engineering and Law consented to audio recordings. The audio recordings were run through otter.ai software to generate transcripts. The transcribed data was exported into Microsoft Word to re-read and correct any grammatical errors. The remaining 12 respondents declined the tape recording, favouring the researcher to collect data through note-taking. The transcriptions and notes were instrumental in generating quotes to provide in-depth respondents' viewpoints. Cohen et al. (2007) point out that transcription allows the researcher to be immersed in the data and develop concrete and well-grounded insights. Additional data was gathered through a review of past scholarly works, and policy documents, including the Education for Sustainable Development (ESD) and Climate Change Act 2016, to comprehend national and Kenyan higher education's role in addressing the climate crisis.

Thematic analysis based on Braun and Clarke's (2006) model was used to analyse the data. Braun and Clarke's (2006) thematic analysis model, characterised by six steps, was utilised. The six steps involved; (1) familiarising with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes and (6) generating a report. Braun and Clarke (2006) state that thematic analysis is a method of analysing qualitative data that involves searching across the data to pin down, probe and report the most occurring patterns. In addition, thematic analysis describes data while simultaneously allowing the researcher to interpret it during coding and selecting recurring themes and patterns. Thematic analysis is best suitable to apply when seeking to comprehend a set of experiences, meanings, thoughts or behaviours across a data set (Braun & Clarke, 2012). The audio recordings were played several times while interacting with the transcripts to allow the researchers to familiarise themselves with the data. While familiarising the data process, note-taking was instrumental to the researchers to comprehend deeper meanings and insights from the data set. Braun and Clarke (2012, p. 60) pinpoint that note-taking in the familiarisation with the data step allows the researcher "to read the data as data."

The second step involved coding using Microsoft Word. Microsoft Word comprises an easy notational system through its set of reviewing tools (Chenail & Duffy, 2011). The reviewing tools are made up of the comment section, highlighting,

insertion and tracking changes that can be conveniently used to identify codes in a transcript. Codes generated from the data set included environmental and climate change policies, common and departmental courses, research, climate change public sensitisation, collective climate action, environmental conservation, opportunities and barriers to climate action. The next step entailed searching for themes. In thematic analysis, a theme is defined as a 'patterned response or meaning' (Braun & Clarke, 2006, p. 10) extracted from the data that informs the research questions (Kiger & Varpio, 2020). Braun and Clarke (2006) state that a theme can be classified as semantic or latent. A semantic theme captures the surface meaning across a data set, while the latent theme focuses on the more profound and underlying assumptions, ideologies and meanings (Kiger & Varpio, 2020). The steps of searching, reviewing, defining and naming steps revealed the following as the final ones from the data; integration of climate change content, campus greening activities, partnerships and collaborations, institutional policies on climate action, opportunities and constraints for the university to contribute to climate action.

7.0 Ethics

Two ethical clearances were sought before the commencement of this study. An external ethical approval from the National Commission for Science and Technology and Innovation (NACOSTI) was acquired. Moreover, the study received internal approval from Kenyatta University's Directorate of Research, Innovation and Outreach. The respondents were either contacted through emails, telephone and physical visits to inform them about the Climate-U project and to plan for their most convenient time to hold the interviews. Upon confirming participation in the study, the respondents were given the Climate-U project information sheet and consent form attached in Appendix III and IV, respectively. After filling out the consent form, the respondents were assured of their confidentiality. Anonymisation of names was done to ensure the confidentiality of the respondents. All the interviewees are referred in this study as respondents, followed by a numerical number representing an alphabetical listing of the first name of their schools or organisation.

8.0 Study Findings

8.1 Integration of Climate Change Content in Kenyatta University Curriculum

Different schools at Kenyatta University have used different approaches to mainstreaming climate change content into their curriculum as presented in table 1.



Table 1.

Integration of Climate Change Content in Kenyatta University Curriculum	
Level of mainstreaming	Schools
Postgraduate climate change programs	<ul style="list-style-type: none"> School of Environmental Studies
Standalone departmental units on climate change	<ul style="list-style-type: none"> School of Architecture and Built Environment School of Environmental Studies
Integrated in common school units	<ul style="list-style-type: none"> School of Education School of Hospitality, Tourism and Leisure Studies
Integrated in departmental units	<ul style="list-style-type: none"> School of Agriculture and Enterprise Development School of Economics School of Engineering and Technology School of Humanities and Social Sciences School of Law School of Pure and Applied Science
Electives	<ul style="list-style-type: none"> School of Law

The School of Environmental Studies offers a postgraduate climate change and environmental sustainability programme. The course exposes students to CCE content through coursework and research. Climate change content is also integrated into departmental courses and units in all other programmes at the school of Environmental Studies. Delivery of climate change content at the school is enriched by guest lecture series facilitated by experts from UNEP. The school organises regular seminars and workshops focusing on environmental-related issues and climate change adaptation and mitigation being one area of concern.

The schools of Education and Hospitality, Tourism and Leisure Studies have each mainstreamed climate change content into one common unit. Students in the School of Education undertake an environmental education course during their first year of education, while the students in the School of Hospitality, Tourism and Leisure Studies take a common course on flora and fauna, both of which include content on climate change. The two schools' common units are not explicitly tailored to climate change issues but cover general environmental and basic climate change issues.

Six schools - Agriculture and Enterprise Development; Architecture and Built Environment; Economics; Engineering and Technology; Humanities

and Social Sciences and Pure and Applied Science - each have a departmental course that mainstreams climate change content. The School of Agriculture and Enterprise Development respondent noted that plans were underway to review many of its courses to include content on smart agricultural practices with a well-grounded linkage to climate change mitigation and adaptation practices. Environmental planning courses at the Architecture and Built Environment School integrate climate resilience issues, best land use practices, and renewable energy. The economic development course at the School of Economics integrates Sustainable Development Goals (SDGs), allowing learners to learn more about sustainability issues, including climate action. Furthermore, two postgraduate courses, master of economics, cooperation and human development and master of development theories and strategies, cover climate change issues directly. A respondent pointed out that:

In the master of economics, cooperation and human development, we have a course where we look at climate change and human development...we look at per capita income. So, the climate has a direct impact on per capita income through its effect on agriculture and related industries and services. The nexus between climate change and how it impacts the overall human development index is captured in that particular course.

-Respondent 5.

The Department of Energy and Technology at the School of Engineering and Technology has a stand-alone unit that mainly covers the content on renewable energy and its contribution to climate action. An interviewee highlighted that:

We have a department - the Energy Technology Department - that teaches matters of renewable energy, including solar energy. We have actually a very big project on solar energy, wind energy, and geothermal in Kenya. We train our students on that and actually, you could say we are contributing to the National Climate Change national framework by producing human resources that are knowledgeable on matters of renewable energy.

-Respondent 7.

In addition, students from the School of Engineering and Technology are exposed to sustainability issues, including environmental conservation and climate change, through ethical practices integrated in several departmental courses.

At the School of Humanities and Social Sciences, students in the Department of Geography learn about climate change issues through a unit on environmental studies. Moreover, at the school, climate change issues are incorporated in Kiswahili and literature studies through creative activities and ecological theories. Students taking psychology and history compulsory classes are exposed to environmental history and eco-criticisms content covered in literary works addressing pollution of ecosystems like the Nairobi River.

The Pure and Applied Sciences School has several courses, mainly

in Plant Science and Biochemistry, Microbiology and Biotechnology Departments. The main content mainstreamed into the courses is knowledge about drought-tolerant crops to boost the resilience of local communities' food systems in a rapidly changing climate. Students in the two departments undertaking the courses on climate change learn about the suitable plant species for restoring marine ecosystems that are vital buffer zones against climate change impacts such as sea level rise and coastal flooding.

Kenyatta University's School of Law courses also touch on sustainable development themes. The School of Law respondent stated that they mainstream climate change into a second-year human rights unit. The content integrated into the unit builds up on the recommendation of Article 42 of the Constitution of Kenya 2010. The Article states that every person has a right to a healthy and clean environment (Republic of Kenya, 2010). The students from the School of Law are taught the environmental and climate change concepts to strengthen the advocacy and creation of healthy spaces. In addition, law students learn several issues of biodiversity protection and combating climate change through two elective undergraduate courses offered in the third and fourth years. This means that not all students are exposed to the content but those who choose to take the course. On the coverage of environmental and climate change concepts, the respondent from the school of law noted that:

In second year, we teach human rights law, when we teach human rights law, because article 42 refers to the environment as a right, so we also touch a bit on climate change, not so much, but we touch a bit, we're exposed students ...we also talk about poverty as an emerging issue, which is driven by climate change....So some of the emerging issues we've identified in environmental law is climate change. Yeah, so we are very keen on that. And also we are we also teach laws of refugees and internally displaced persons. And now you know that they're refugees that have come about because of climate change. So we are also teaching the whole issue around climate change, displacement and refugees. We also teach human rights law to second year. So environmental law is to third years, law of refugees and internally displaced persons is to fourth years. So those two are electives. So it means there is a possibility that if a student does doesn't do them, then they may leave the school without ever hearing about climate change.

-Respondent 11.

At the master's level, the School of Law does not have any course that mainstreams environmental and climate change issues. However, the respondent highlighted that lecturers are encouraged to cover the content when teaching various law-related topics. The respondent from the school noted that they teach a component of environmental law and natural resources at the master's level, under which they cover some aspects of climate change. The respondent stated that:

We teach environmental law, and we have students who are in the environmental club. The environmental law course is taught at the undergraduate level; we don't have a master's program at the moment.

-Respondent 11.

The analysis reveals that climate change content mainstreamed into common and departmental courses "do not sufficiently" cover climate change issues. Respondents from the schools of Education and Engineering and Technology noted:

The content covered on climate change might not be sufficient. You know at undergraduate they are supposed to get the basics for them to understand the operation. But I want to say that besides covering the climate change aspects in other courses, the departments serviced by the Department of Geography have also a unit called Climatology that deals with the climate matters. So basically, I would want to say that the general information they have will not go into the mitigating that climate change, - the course gives them an understanding of what is expected when it comes to climate change mitigation and adaptation.

-Respondent 6.

The integrated content provides a basic understanding of the phenomenon in a simplified language. Although climate change is a cross-cutting issue, courses in most Kenyatta University schools cover other issues that are faculty and discipline-specific. Thus, using a simplified form of mainstreaming and teaching climate change plays a significant role in helping students from various disciplines understand the phenomenon. The scientific basis of climate change is technical and overwhelming, especially for students from disciplines without an environmental background (Hayes & Parkin, 2021). However, simplifying CCE is a systematic way of ensuring that the scientific language of climate change is accurate, accessible and easy to comprehend (Hayes & Parkin, 2020; Hayes & Parkin, 2021). Teaching CCE in simplified form empowers the students to make connections from abstract to more well-grounded and concrete information, making the learning meaningful and encouraging students to develop environmental responsibility and stewardship.

Nonetheless, the School of Law respondent stated that climate change content incorporated into elective courses effectively and adequately covered the phenomenon. Learners are provided with information on linkages between human rights, displacement of communities and climate change.

In addition, most Kenyatta University schools allow their students to learn more about climate change through research. Undergraduate research projects, postgraduate theses, and dissertations enable students to undertake extended learning of climate change and relate it to their study area. The skills and knowledge that the students acquire from coursework assist them in carrying out the mandatory projects, theses and dissertations to meet their respective course requirements. The schools and departments allow students to select the research



topics from climate change challenges affecting their localities. One of the respondents highlighted that:

There is also a lot of research being carried out in the school, though at the individual level, in trying to re-engineer plants that are drought resistant in the West Pokot and Nyanza regions. There is also a lot of research on the diseases that are coming up due to climate change; changing rainfall patterns, temperatures, as well as research activities on mangroves along the Kenyan Coast.

-Respondent 15.

Faculty members guide the students to link their research topic on climate change issues to their speciality area. A respondent noted that:

... I am supervising a student at PhD who is studying adaptations to climate variability in maize production in Kenya...I am aware also of two students in a class that I have just taught research methods - one is looking at Maladaptation, another one is looking at Climate Change and its Impact on livelihoods of pastoralists in Turkana. So generally I think that there is a way in which climate change is embraced in our training and research.

-Respondent 5.

Although the students are not required to research climate change, many of them from different schools focus on community challenges triggered by the phenomenon. Moreover, the research allows the students to generate new findings that lay a foundation for teaching and learning about climate change in their schools. The students' research supports the efforts of Kenyatta University's Division of Research, Outreach and Innovation (RIO) to generate blue-ribbon research about societal issues. RIO is committed to supporting students and staff to develop research that provides evidence-based innovations to societal needs (Kenyatta University, 2022b).

School of Law students are also exposed to extended learning about climate change issues through moot court competitions. The school organises the All Kenyan Moot Court Competition (AKMCC) annually and invites all law schools across Kenya to participate. The primary role of AKMCC is to support and promote the role of scholarly research and sharpen the advocacy and analytical skills of the students to bring social change through the legal profession. The respondent noted that:

Law students learn well through mooting. So there are moots on environmental law, which is the famous one also known as Stetson...the Stetson moot on environmental law does touch on climate change. Other moots like the African human rights law moot has a big component on environmental law... So in that sense, we do feel that a student who passes through our school in one way or another will encounter issues of climate change. They wouldn't do the four-year law degree and never have heard about environmental law and much more climate change.

-Respondent 11.

Besides, implementing the Transforming Universities for a Changing Climate Project (Climate-U) at Kenyatta is a significant step towards mainstreaming climate change content into the university courses. A Participatory Action Research Group (PARG) comprising stakeholders from Kenyatta University faculty members, students, civil society and government agencies was formed to implement the project. The PARG discerned that the university is a knowledge production centre; thus, there was a need to strengthen the teaching, research and community engagement to contribute to climate action efforts. Mainstreaming climate change content was selected as the feasible intervention to implement under Climate-U. Exposing students to CCE would transform them into multiplier agents of climate change awareness. Mainstreaming climate change content into the Kenyatta University curriculum supports Climate-U's objective of contributing to theory and understanding of the impact of higher education on climate change and sustainable development.

Therefore, the Growing Leaders Programme, a certificate programme offered to all final-year students, was reviewed. Two topics, the role of leadership in climate action and sustainable development goals, were added to the programme. The certificate programme is mandatory for all final-year students to meet the university's graduation requirements. Students across all schools must undertake the certificate course to sharpen their leadership skills and address several societal challenges. Information on various aspects such as biodiversity conservation, indigenous knowledge, gender and social inclusion, youth leadership and climate change impacts, drivers, mitigation and adaptation were integrated into the course. The PARG recognised the need for new pedagogic approaches to make the Growing Leaders Programme attractive to students. Thus, diverse delivery modes have been adopted, including practicals, student projects and themed guest lectures to make the course more interactive and impactful. The programme is expected to prepare students to acquire ideal leadership traits to champion climate action and educate communities about climate change.

However, a few schools, like the School of Medicine, lack courses that cover climate change and related content. Thus, students at the school are not directly exposed to teaching and learning on climate change issues. However, the respondent from the school noted that the school recognises that climate change is a cross-cutting issue that needs to be taught to students in all disciplines. The interviewee pointed out that the school plans to revise several courses to integrate content on climate change impacts like floods and extreme heat waves and their effects on community health systems and livelihoods.

8.2 Campus Greening Activities

The university is implementing several greening activities, including biodiversity conservation and diverse efforts to combat climate change as presented in table 2.

Table 2.

Campus Greening Activities	
Activity	Responsible Party
Tree planting	<ul style="list-style-type: none"> School of Environmental Studies School of Law
Responsible Consumerism	<ul style="list-style-type: none"> School of Economics School of Engineering and Technology School of Environmental Studies
Waste management	<ul style="list-style-type: none"> School of Architecture and Built Environment (Architects Club) School of Environmental Studies School of Economics (KUESA) School of Environmental Studies (KUNEC) School of Law
Educational trips	<ul style="list-style-type: none"> School of Environmental Studies School of Hospitality Tourism and Leisure Studies
Climate-resilient development and planning	<ul style="list-style-type: none"> School of Architecture and Built Environment
Green Education Days	<ul style="list-style-type: none"> Green Education Hub

The greening activities are significant in ensuring that the university participates in national, regional and global climate action. Greening activities range from large-scale initiatives carried out by the schools with collaborations and partnerships with external actors from government entities and civil society to students’ spearheaded activities. The School of Environmental Studies coordinates tree-planting exercises at the university. In addition, the school manages a tree nursery at the university in partnership with the Kenya Forest Service and Kenya Forestry Research Institute (KEFRI).

The School of Environmental Studies leverages these partnerships to acquire seedling donations and information on tree species that can enhance mitigation and promote adaptation to climate change among communities across Kenya. So far, KU has a tree cover of about sixty per cent. The school also partners with Kenyatta International Convention Centre (KICC) to plant fruit trees within the

university. Currently, approximately five hundred fruit trees have been planted at the university. Experts from the school advise the university on indigenous tree ideal for rehabilitating various ecosystems. The school’s collaborations with various external organisations in afforestation projects has led to the establishment a botanical garden characterised by different indigenous tree species at the university. Additionally, the School of Law participated in the United Nations millennium campaign by planting ten thousand trees to rehabilitate degraded lands and raise awareness about biodiversity conservation and green energy. The campaign was also influential in supporting grassroots initiatives that promote environmental protection. The respondent highlighted that:

I don’t know whether you came across something called the UN Millennium campaign. It’s something that involves university students...our students had a project where they planted ten thousand trees all over Kenya.

-Respondent 11.

Kenyatta University’s environmental policy guides all schools to ensure their operations and practices align with environmental conservation activities. Therefore, schools must institute measures to ensure staff and students support the university’s sustainable development agenda. For example, staff and students are expected to utilise sustainable waste management practices to avoid littering and utilise natural lighting during the day to reduce electricity consumption. The practices play a significant role in helping Kenyatta University reduce its ecological and carbon footprints, a crucial step in addressing climate change. For instance, the school of Engineering and Technology continually reminds staff to switch off lights during the day when not needed to reduce the electricity cost and contribute to lowering the ecological footprint. A respondent explains that:

...one of the things we do is to continuously remind the staff that every time you leave, ensure that you have your lights put off so most often you will not find lights on in the building at night. So that is one way of conserving energy so that we ensure some form of sustainability.

-Respondent 5.

Kenyatta University Environmental Club (KUNEC), the Coca-Cola Company and several corporate organisations have implemented a plastic bottle recycling project. Collection bins have been set in several areas within the university that are prone to plastic bottle littering. KUNEC encourages students to use the bins to dispose of recycled plastic bottles. Schools’ waste management practices practised within the university are extended to immediate communities through environmental social and governance (ESG), similar to corporate social responsibility (CSR) efforts. Students clubs such as the KUNEC, Kenyatta University Economics Student Association (KUESA), Architects Club, environmental law club and Kenyatta University Students Association (KUSA) carry out community clean-ups and other activities touching on waste management and environmental advocacy.



Individuals from communities neighbouring the university are educated on sustainable lifestyles such as circular economy practices, recycling, reuse and reduction to minimise waste generation that degrades the aesthetic value of ecosystems. Students' clubs' activities and the university staff, through the community outreach services, visit the communities to teach individuals about sustainable lifestyles. The clean-ups also improve students' communication skills and provide hands-on experiences to create healthy, liveable spaces. Students from the schools of Environmental Studies, Hospitality Tourism and Leisure Studies participate in educational trips to various areas within the country. During the trips, students are exposed to knowledge of climate change impacts affecting local Kenyan communities. The trips also allow the students to document the local experiences of climate change through short videos, photographs and research to generate a wide array of teaching and learning materials.

The School of Architecture and Built Environment supports the university's climate action by enhancing climate-resilient development and planning. Kenyatta University is shifting to construction that protects biodiversity by constructing modern green buildings. The responsibility of designing green buildings at the university is mainly vested in the School of Architecture and Built Environment. The school ensures that new construction at the university is implemented with minimal ecological footprints and within the regenerative capacity of the natural resources utilised as raw materials. Most buildings at the university utilise natural lighting during the day and are adequately equipped with waste collection bins to encourage positive attitudes toward waste management among the staff and students. In addition, the school boosts several well-experienced professionals who assist in designing green buildings for individuals and organisations across the country.

The School of Architecture and Built Environment is also involved in environmental planning. Environmental planning plays a significant role in ensuring the proper utilisation of land, a finite resource. The school believes that the way settlements are planned must take care of the environment. For instance, some land must be reserved for green zones to act as carbon sinks. Implementing land zoning and other best land management practices allows Kenyatta University to be a model institution on sustainable development aligned with climate action.

Furthermore, to support green initiatives at the university, the Green Education Hub was established as an outcome of the Transforming Universities for a Changing Climate project. The Hub acts as a centre of climate information to enhance the university climate action. The Hub is involved in research, co-creation and dissemination of teaching and learning materials on climate change, sustainability and green education. Materials and content co-created with the students and other stakeholders include audio-visuals, creative arts, documentaries and dioramas. Over 200 students from all disciplines have signed up as ambassadors spearheading the awareness campaigns through engagement in activities like sports, art, and guest lectures, among others. The Hub, through student ambassadors, also participates in university-

community engagement activities like training members of society on sustainable lifestyles to combat climate change.

8.3 Partnerships and Collaborations (community engagement, government and non-governmental organisations)

Besides teaching and research, community engagement is one of the tripartite functions of universities (UNEP, n.d). Schools at Kenyatta University have embedded community outreach services in their operations. The schools recognise that working closely with the communities leads to the mobilisation of resources and sharing roles to identify and provide practical solutions to societal challenges. Furthermore, higher education institutions are knowledge production centres and are part of a community; thus must play a significant role in ensuring that they utilise the knowledge and other resources to bring positive social change. Community outreach services are implemented in communities and institutions in lower-level learning institutions.

Seven schools at Kenyatta University implement various initiatives in communities across the country. The schools of economics and law occasionally clean up in several communities within Nairobi and Kiambu counties. A respondent pointed out that:

We have had community outreach through CSR through our students...we have visited a children's home in Mathare and recently, we have also visited a rehabilitation center in Ruiru. Now one of the activities that we do during such times is clean ups and education on waste.

-Respondent 5.

The primary role of the clean-ups is to raise and inform community members about sustainable waste management practices. Students' clubs spearhead the clean-ups, giving them hands-on experience implementing initiatives that conserve and protect biodiversity. Staff members and students support the communities in linking the effects of unsustainable waste management to global warming and other extremes of climate change. The School of Engineering and Technology sensitises primary and secondary school students about various national climate change frameworks and objectives. Faculty members from the school interact with students from lower levels of learning during their educational trips to Kenyatta University. The School of Engineering and Technology respondent pointed out that primary and secondary school students visit the school to learn about innovations they can implement in their institutions to support national climate action efforts.

The School of Hospitality, Tourism and Leisure Studies conducts extensive training through CSR to communities situated in tourist attraction "hotspots". Community leaders, members, Community Based Organisations (CBOs) and civil society and government representatives are involved in the training. The primary objective

of the training carried out by the school is to create awareness in the community about the challenges of climate change in the hospitality and tourism sector. The community members are then encouraged to apply localised innovations to address the climate crisis. Moreover, the School of Education conducts counselling sessions in Nairobi and Kiambu Counties communities ravaged by ecological destruction and climate change-related challenges. The counselling sessions play a significant role in giving communities adequate information and equipping them with skills to cope with property destruction and fatalities caused by extremes of climate change. Students and staff identify communities within Nairobi and Kiambu Counties to receive the counselling sessions and environmental protection projects and link them with the School of Education. A respondent stated that:

There are some students together with the members of staff with connections out there. And they go there and then they involve the school. We support them in terms of materials and ideas. We have some schools like Kiwanja is part of us. So some of the parents there, they work here. And they come to tell us their needs and it is on that basis that we respond to the needs. And the outreach itself is out of a demand from outside the university. Where there is that particular need for it. And people requests and people pass through there the lecturers the students they so request. There is a time about two years ago I had some students who wanted us to go to Kibera and I gave them an okay, they went to Kibera to do some kind of cleaning. We took care of the environment. Students completed and they've done a very good job. So it's not really confined within here.

-Respondent 6.

Apart from the counselling sessions, the School of Education trains the communities in Nairobi and Kiambu Counties on strategies to implement to reduce environmental destruction that aggravates climate change. In some instances, communities benefit from financial support from the School of Education to cushion them against climate change impacts such as droughts and famine. The financial support assists the communities in purchasing food supplies as food productivity from the local food system is greatly affected by unpredictable weather patterns. Furthermore, the pure and applied sciences school engages in community outreach services to train farmers on best agricultural practices to boost local food production. A respondent stated that:

We give them information that touches on their life. Information that they use to change their lifestyles. Information that changes their environment considering the risks of climate change. Sometimes we come in and we support them in terms of finances during famine.

-Respondent 6.

The School of Medicine conducts several medical camps in communities. The primary purpose of the medical camps is to create awareness about the challenges of climate change in the health sector. Members of staff and students offer counselling and other medical services to community members. In addition, students carry

out medical camps in the lower eastern and coastal areas where they diagnose to help local communities identify their ailments and receive medical care. The respondent stated that:

We conduct medical education and awareness in communities around Nairobi Metropolitan Area. During the camps, the local community members are exposed to information on how climate change increases the occurrence of diseases such as flu and how to manage them.

-Respondent 12.

Kenyatta University School of Law has collaborated with communities from Lamu and Turkana to document the environmental destruction of the Lamu Port South Sudan – Ethiopia Transport (LAPPSET) project. An interviewee pointed out that:

Together with the Friends of Lake Turkana, we have documented the LAPPSET case. We've deconstructed the legal principles, and it is going to be used for educational purposes to the ordinary Kenyan. Ordinary Kenyans will be able to hear and see what the court said, the arguments that were made about climate change that comes with the destruction of the mangroves and also the destruction of the environment to create room for the port...We have documented the case to be screened in the entire Sub-Saharan Africa to educate communities within Kenya and communities within Sub-Saharan Africa on how to assert their environmental rights.

-Respondent 11.

Kenyatta University Centre for International Programmes and Collaborations (CIPC) is crucial in linking the university to other higher education institutions and organisations. Additionally, CIPC is responsible for Kenyatta University's international strategy, specifically on student exchanges. The Centre has played a vital role in ensuring that the University works closely with the immediate communities in Nairobi and Kiambu Counties to bring positive social change. Various activities across the environmental and socio-economic dimensions have been implemented through Kenyatta University's engagement with communities across Kenya. A respondent noted that:

The university supports community engagement services through visits to schools, children's homes, tree planting exercises, and conferences.

-Respondent 11.

During the visits to children's homes through the CSR programme, the university staff and students educate the children on sustainable lifestyles they need to adopt to ensure ideal liveable spaces. The tree planting exercises are undertaken to teach the students and communities about sustainable practices they can adopt to conserve the environment and contribute to national afforestation efforts.



The primary goal of the conferences is to build capacity on sustainable development priority areas and how communities, staff and students can collaborate in implementing appropriate activities. CIPC collaborates with the United States Agency for International Development (USAID) and the German Academic Exchange Service (DAAD) in student exchange. The student exchange programme is an ideal opportunity for the university's learners to visit other higher education institutions across the globe and acquire the information they can utilise to develop innovations that assist communities in coping with climate change challenges.

All the schools at Kenyatta University have diverse partnerships with different actors involved in environmental conservation and climate action. The objective of instituting collaborative efforts is to bring positive social change. Schools and stakeholders involved in the partnerships aim to create an equilibrium between economic development, social transformation and biodiversity conservation by implementing sustainable projects and encouraging communities to embrace sustainable lifestyles. Stakeholders that partner with Kenyatta University schools range from government entities, civil society groups and national, regional and international educational institutions.

The partnerships between the School of Medicine and the Lizzie Wanyoike Foundation, for example, allow students to participate in community services. Students get the chance to engage in community outreach services that assist communities in comprehending the challenges of climate change in the health sector. Engagement with the community improves the students' knowledge and skills in offering effective medical services to communities grappling with severe extremes of climate change that disrupt social systems. In addition, the school and Lizzie Wanyoike Foundation provide well-skilled experts that conduct capacity-building sessions on strengthening local health systems in a rapidly changing climate.

On the other hand, the School of Pure and Applied Sciences partners with the National Museums of Kenya (NMK), National Research Fund (NRF), Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), Kenya Wildlife Service (KWS) and indigenous communities on several activities. The school also works closely with farmers from communities in Marigat Baringo County to conserve medicinal plants. Most of the area's medicinal plants are classified as near threatened, threatened and endangered due to overexploitation. The extinction of medicinal plants threatens the supply of herbs to traditional health systems that support the effective thriving of indigenous communities.

Thus, the partnerships between the School of Pure and Applied Sciences and communities in Baringo County play a crucial role in ensuring the adequate preservation of tree species of great importance to traditional healthcare services. Moreover, the school partners with KWS to identify plants and animals negatively impacted by climate change. The exercise plays a significant role in creating a database of flora and fauna that require adequate protection from the extremes of climate change. The school also partners with RUFORUM to research various community climate change issues. Scientific explorations that the school and RUFORUM carry

out generate practical solutions that are key in designing locally-led mitigations and adaptations. NRF and RUFORUM fund such research activities by the School.

The schools of Education and Law work closely with communities to conduct several activities that range from waste management practices to documentation of environmental challenges. The School of Education recognises that community partnerships provide favourable results due to long-lasting collaborations.

Partnership is first and foremost with the community. I think that's the starting point to understand the issues that surround the climate change... If you can get to involve a community, then you are sure that kind of partnership will continue. The way I am seeing it if it starts, we would want ideas shared. What is that we want the university to do? And what is that they themselves (community) will do and that one will be sustained for long. But if we look for finances elsewhere we might not get them, so we shall be able to get resources from within and engage with the community so that we first ask them that this is what we are willing to go the direction that they want.

-Respondent 6.

The School of Law has effectively partnered with communities in Lamu and Turkana counties to document environmental challenges triggered by economic development. The partnership between the school of law and communities in Lamu and Turkana has been documenting the detrimental environmental effects of LAPPSET.

The School of Law partners with the Centre for Advanced Studies in Environmental Law and Policy (CASELAP) to implement greening activities. Professionals from the school participate in implementing activities carried out by CASELAP, such as afforestation and research on several climate changes and environmental-related issues. CASELAP's partnership allows course instructors from the law school to influence policies that advocate for climate action. Partnerships and collaborations between the school of environmental studies, NEMA, KEFRI, KFS, KWS, Nairobi county government and UNEP have been crucial in implementing climate mitigation and adaptation within Kenyatta University and the immediate communities.

Government agencies such as KWS and Kenya Forest Service (KFS) provide their experts to the School of Hospitality, Tourism and Leisure studies to conduct themed guest lectures on the effects of climate change on the tourism sector. The School also partners with the National Environment Management Authority (NEMA) to provide themed guest lecturers about environmental laws and policy-making to the students. Apart from working with the organisations closely to conduct themed guest lectures, students get a chance to secure industrial attachments and internships. An interviewee highlighted that:

We have partnerships with NEMA because when we teach environmental law, we invite them to come and teach a component of it; we could say we also have a relationship with NEMA in the sense that they offer our students internship.

-Respondent 11.

The School of Economics has several partnerships with non-governmental organisations (NGOs) and higher education institutions across the globe. The respondent noted that:

...we have exclusively a course on climate change and human development. It is a collaborative program. So we partner we partner with... University of Pavia, in Italy. And then in Kenya, Tangaza University College... And then we have NGOs. One of them is CISP, it is an abbreviation of an Italian name, but the English translation is the International Committee for the Development of Peoples but use the CISP is an abbreviation of an Italian form.

-Respondent 5.

The primary objective of partnerships is to co-create knowledge to mainstream into various courses offered by the school of economics. The widespread participation of various stakeholders in identifying and refining content to be mainstreamed in a course ensures that students undertake a course that equips them with adequate knowledge and skills to address developmental issues, including climate change. Furthermore, students gain knowledge on various developmental and climate change issues from various sectors and geographical locations due to comprehensive information mainstreamed into a course by professionals from different backgrounds. Moreover, partnerships between the School of Economics, University of Pavia, Tangaza University and CISP also aim to strengthen research. However, the school has not been involved in research that is directly related to climate change. The respondent from the school of Economics highlighted that:

We partner to co-create the knowledge. We partner in research activities, but none of the research done so far touches on climate change. Most recent research activities focus on COVID and livelihoods, and on health and debt sustainability.

-Respondent 5.

However, projects implemented through the partnerships between the school of Economics and the stakeholders have space for scientific explorations on climate change issues. Consultations between the school of Economics, other HEIs and NGOs have identified climate change as a cross-cutting issue to all sectors. Thus, the respondent noted that the school of economics and actors involved in the consultations recognise the need to conduct evidence-based research that generates practical solutions to communities in Kenya.

The School of Economics has identified informal settlements as the most affected by the extremes of climate change due to their low-adaptive capacity triggered by low income and poor infrastructure. Therefore, researching climate change impacts will play a significant role in generating sustainable initiatives to assist informal settlements in coping with the impacts of a rapidly changing climate. Additionally, the School of Economics works closely with the UNESCO Chair for Higher Education Development for a Green Economy and Sustainability (HEDGES) based at Kenyatta University. The school was identified as a key stakeholder in providing experienced professionals to institute capacity-building programs that encourage students to embrace

green jobs and a circular economy. The respondent stated that:

The school of economics is important in educating for green jobs and ensuring that we expand our activities with our students in matters related to climate change.

-Respondent 5.

The collaboration between the School of Economics and UNESCO-HEDGES plays a significant role in instilling positive environmental values in students. Learners are empowered to adopt sustainable lifestyle practices that promote responsible consumption and production. Circular economy practices give the students a chance to earn an income while at the same time engaging in environmental protection.

CIPC has been instrumental in linking Kenyatta University to national, regional and international partnerships and collaborations that champion sustainable development, including climate action. Climate action collaborations and partnerships instituted at Kenyatta University by CIPC aim to strengthen the traditional teaching, research and community engagement roles. The CIPC have the Modern Competencies of Academic Teachers (MOCAT) that allows lecturers to sharpen their online and blended delivery skills of environmental education knowledge to the students.

MOCAT improves the online pedagogic methods of teaching students about environmental education. Course instructors acquire adequate and relevant skills and knowledge from MOCAT to design courses and deliver thought-provoking lectures that evoke learners' interest in learning about environmental issues, including climate change.

CIPC has been influential in linking Kenyatta University to partnerships and collaborations on climate action implemented by several stakeholders. The respondent stated that:

Kenyatta University has several partnerships with Environmental Systems Research Institute, Inc. (ESRI) that relates to geo-mapping. We also have partnerships with UNESCO Chair for Higher Education Development for a Green Economy and Sustainability (HEDGES), Kenya National Commission for UNESCO (KNATCOM) and Water Resources Authority.

-Respondent 4.

ESRI provides licenses to its geomapping software at Kenyatta University, allowing students access to Geographical Information Systems (GIS) and remote sensing tools. The software allows learners to sharpen their skills in geospatial database development by using GIS and remote sensing to generate climate and environmental maps. Moreover, climate and environmental-related partnerships and collaborations primarily aim to provide staff, students and communities with adequate capacity building on environmental conservation issues. Emerging issues such as climate change are addressed during the capacity-building forums. Staff, students and communities acquire information and skills for identifying sustainability challenges in their



locality from the capacity-building training conducted by external professionals from civil society and government agencies. Equipping the university staff, learners and community members with climate information empower them to provide suitable solutions to the climate crisis, including raising awareness of climate change.

Kenyatta University CIPC works with students' clubs, such as KU-UNESCO, that engage in environmental and climate change-related activities to create murals and other art forms. The artwork is primarily used for environmental and climate advocacy, helping the university community acquire information about the environment to change their lifestyles and support efforts to address climate change. The collaborations have been successful because several workshops, conferences and capacity-building training have been organised for staff, students and communities to acquire knowledge and skills on sustainable development.

Additionally, NEMA has several sustainable and education-related collaborations and partnerships with various HEIs in Kenya. The authority works closely with HEIs in the RCE network to conduct extensive research, training and community projects to solve environmental and climate-related challenges. The authority co-hosts conferences and workshops on various sustainable development issues, including environmental protection and climate change. During the workshops and conferences, the authority and other relevant stakeholders discuss suitable approaches to ensure the country's development is aligned with the sustainability pathway.

8.4 Institutional Policies on Climate Action

The study aimed to ascertain whether schools at Kenyatta University have an environmental, sustainability or climate change policy or action plan. Interviews revealed that nine schools rely on the general university environmental policy. The nine schools align their operations with the general university's environmental policy to support the institution's commitment to environmentally-friendly practices. A respondent noted:

We actually just utilise the general university policy. We don't have our own in-house.... most of the issues are more related to general university policy, like keeping the environment clean, managing our waste and the rest you know, they are all managed within the provisions that the university makes.

-Respondent 5.

However, two schools, Engineering and Technology and Architecture and Built Environment schools, have in-house environmental and sustainability policies that are key in guiding their operations and practices. Architecture and Built Environment respondent stated that the school's policy helps the course facilitators mainstream climate resilience and sustainable utilisation of land, a finite resource, into the courses. The respondent highlighted that:

It is our policy to have inbuilt environmental issues in the curriculum. In our curriculum, we emphasise content on climate resilience, the wise use of land and how best to utilise this finite resource, especially when it comes to the built environment and environmental planning. We also incorporate environmentally sensitive issues, for example, adopting energy-saving techniques.

-Respondent 2.

On the other hand, the School of Engineering and Technology's environmental and climate change policy is influential in ensuring that the school supports the university's efforts to conserve biodiversity. The policy guides the school in mainstreaming sustainability issues such as renewable energy technologies.

NEMA relies on two policies, the National Environmental Policy of 2013 and the ESD policy of 2017, to support education. During the engagement with HEIs in various annual workshops and conferences, NEMA advocates for the active participation of HEIs in implementing the policies. The National Environmental Policy of 2013 and the ESD policy of 2017 call for widespread environmental protection awareness through collaborative efforts from research institutions, government agencies, civil society and communities. The respondent from NEMA stated that:

The Authority (NEMA) supports the universities in the implementation of the National Education for Sustainable Education Policy through the Regional Centres of Expertise (RCEs) which are all hosted by different universities.

-Respondent 13.

NEMA utilises the Regional Centres of Expertise (RCEs) located in various universities to implement practices recommended by the ESD policy of 2017. One major achievement supporting the implementation of ESD policy has been increased public awareness and training on embracing sustainable development initiatives through RCEs activities. ESD policy implementation has been influential in assisting individuals in realising that education is an integral and powerful tool for informing communities to shift to a green economy. NEMA's support for implementing the ESD policy of 2017 in HEIs has led to the development of effective pedagogies. The new pedagogies equip students with knowledge, skills and attitudes to support sustainable development initiatives. NEMA has been actively involved in assisting universities in implementing research projects. Contributions of skilled experts from the authority were key in helping Kenyatta University, Kisii University and Kenya Methodist University PARG to identify sustainable interventions under the Climate-U research project.

Furthermore, the Climate Change Act of 2016 mandates NEMA to perform several functions to support the participation of HEIs in climate action. The respondent from NEMA highlighted that under the Climate Change Act 2016, the authority shall:

Monitor, investigate and report on whether public and private entities are in compliance with the assigned climate change duties; regulate, enforce and monitor compliance on levels of greenhouse gas; Integrate climate risk and vulnerability assessment info all forms of assessment and for that purpose liaise with relevant lead agencies for their technical advice emissions as set by the Council under this Act and report annually to the National Climate Change Council.

-Respondent 13.

Moreover, CCD supports the education sector in Kenya by implementing the National Climate Change Learning Strategy 2021-2031 and the Climate Change Act of 2016, specifically section 21. Section 21 of the Act mandates the Kenya Institute of Curriculum Development (KICD), upon the advice of the National Climate Change Council, to integrate climate change content into national curricula at all levels (Republic of Kenya, 2016). CCD recognises that education is important for raising climate change awareness and empowering citizens to participate in climate action. Mainstreaming climate change content into primary, secondary and tertiary-level curricula presents an opportunity to equip learners with adequate knowledge and skills to develop sustainable mitigation and adaptation measures.

The State Department of University Education and Research relies on its sustainable development on education guidelines to support HEIs in Kenya. The respondent indicated that they encourage HEIs to develop courses that mainstream environmental protection issues, including climate change. The state department also challenges universities to develop research that informs policymakers on localised mitigation and adaptation to climate change to institute in communities. The respondent noted that the state department uses Kenyan climate change policies and SDGs to encourage HEIs commitment to climate action. The respondent stated that:

We are focusing on policy in the area of climate change. For instance, national and international policies, there are also Sustainable Development Goals geared towards sound development. As a department, we are also advocating for universities to use national policies recommendations and SDGs to address environmental issues.

-Respondent 16.

8.5 Opportunities that Exist for Kenyatta University to Contribute to Climate Action

Most schools at Kenyatta University have instituted or are progressing toward developing goals to contribute further and support the institution's future climate action efforts. Respondents from the schools interviewed at Kenyatta University view the mainstreaming of climate change content into their programmes as opportunities to be actively involved in climate action. The respondent stated that:

Reviewing our curriculum to mainstream important dimensions on climate which are not already covered is our priority. This should be across all the programmes...it can even go beyond the school to involve the entire university. A common or core university course that directly looks at climate change and development generally can work well.

-Respondent 5.

Mainstreaming climate change into a university common course allows various schools to collaborate in developing a common course on climate change. The involvement of all schools in mainstreaming the climate change content will ensure that sufficient information on climate change is integrated. All students will acquire basic information on how their fields of study can contribute to local and national climate action efforts. A respondent noted that:

There are opportunities for all schools in KU to collaborate and have one common goal in fighting climate change. Climate change, therefore, should be mainstreamed across the disciplines in KU since it is a cross-cutting issue.

-Respondent 2.

The schools will depend on internal and external collaborations and partnerships to review and green the courses. The teaching and short-term greening goals of the school of education will involve collaborations with the school of environmental studies to review whether the environmental education unit covers climate change content adequately. A review of the unit by the two schools will ensure that the unit covers climate change issues to expose the school of education students to basic information about the phenomenon.

The School of Economics discerns that reviewing its programmes to integrate climate change and sustainable development content will ensure that the students are well informed about climate crisis issues. The School of Engineering and Technology plans to mainstream climate change content into its courses in all departments to support the university's teaching goals in the short term. A respondent from the school stated:

In the short term, we want to incorporate climate change in our curriculum in all the departments within the School of Engineering and Technology. We also want to take a determining role in mitigation and adaptation of measures that would lead to climate change mitigation or regulation.

-Respondent 7.

However, due to the long approval process of revised and new courses, the School of Agriculture and Enterprise Development plans to institute a review of the courses as a long-term teaching and research greening goal. The respondent highlighted that the school intends to revise its courses to include climate-smart agriculture practices that expose students to CCE, mitigation and adaptation. In addition, the School of Medicine, through internal collaborations at Kenyatta University, plans to integrate knowledge on emerging illnesses triggered by climate change and strategies to cope with climate-related disasters.



Medicine and Pure and Applied Sciences schools have opportunities to get involved in climate action through research. Students and school members' research projects will likely generate valuable data and recommendations to address climate change challenges. The school of pure and applied science notes relevant organisations should fund research projects to ensure that evidence-based mitigation and adaptations of climate change are generated. On the other hand, the school of Medicine discerns that research will play a significant role in generating data to help communities minimise climate change-related illnesses. Additionally, in the short term, the School of Engineering and Technology plans to research on climate change issues through the Agricultural and Biosystems Engineering Department. The research will play a significant role in generating strategies and approaches to addressing climate change. An external respondent from the CCD noted that supporting universities in research will generate effective mitigation and adaptation measures for climate change. CCD aims to partner with HEIs to research climate change impacts affecting Kenyan communities and generate unique-locally led mitigations and adaptations. Thus, CCD supports for research presents an opportunity for HEIs to engage in scientific explorations about the climate crisis and generate well-grounded information and innovations.

The School of Engineering and Technology's respondent discerns that partnerships and collaborations present an opportunity to support climate action efforts actively. The respondent pointed out that the School of Engineering and Technology seeks to establish partnerships and collaborations with relevant organisations that align their operations to SDGs. Students will get a chance for industrial attachments to the organisations and learn skills such as designing green energy innovations that will contribute immensely to mitigating and adapting to climate change. The respondent stated that:

...opportunities that probably exist include partnering with the industry, with parastatals such as the Kenya meteorological Department to train students ... when they go for industrial attachment... the partnership we have with KETRACO plays a role in exposing the students to climate action.

-Respondent 7.

Schools within the university have contributed to greening the campus by writing funding proposals to government agencies and international organisations. For instance, the School of Engineering and Technology has written a proposal for erecting solar panels. The respondent from the school reported that:

We've developed a proposal where we've requested the university to consider, putting up smart parking lots that are covered with solar panels. And these would help us in generating our own energy. So that we again help in mitigating climate change by using solar energy, renewable energy, and that is part of greening the environment.

-Respondent 7.

Opportunities could be derived from research projects if the university reaches out to organisations to fund postgraduate students carrying

out scientific explorations on climate change topics. The respondent from the School of Education noted that:

The school has a better chance of coming up with a proposal that can go to government and non-governmental organisations to request for support to green the university... the school has internal capacity to implement some of the greening activities like installation of solar energy.

-Respondent 6.

The School of Agriculture and Enterprise Development's short-term teaching and greening goals include setting up a large-scale plantation of *Melia volkensii*. The school is situated in a semi-arid area that faces extreme environmental conditions like droughts, scarce rainfall and fluvial flooding. Course instructors will use the plantations as a teaching environment to educate the learners on drought-tolerant tree species that can thrive in the country's semi-arid regions. For instance, the School of Agriculture and Enterprise Development plans to engage in climate-smart practices like tree planting of *Melia volkensii* to provide fodder to farmers and contribute to afforestation and reforestation efforts.

The School of Agriculture and Enterprise Development aims to partner with the Kenya Seed Company to produce hay at a large scale. Production of hay will ensure that livestock keepers within the community have quick access to pasture and cushion them against climate change impacts like droughts that lead to the drying of streams and deterioration of pasturelands. The school will rely on well-experienced and qualified professionals to collaborate with other actors to implement other climate-smart agricultural practices that will transform communities in the lower eastern to be food sufficient. Kitui County government plans to set up an office at the School of Agriculture and Enterprise Development to bring the devolved government services closer to communities. The in-depth collaborations with Kitui County Government will ensure that the campus becomes a centre of "demonstration" on climate-smart agriculture.

The Economics School plans to begin models about climate change challenges on economic dimensions. Modelling will generate adequate data that will significantly transform the socio-economic dimensions of communities vulnerable to climate change. The respondent noted that:

Our major area of contribution is modelling...modelling those relationships and in forming data collection, so that we can have more evidence based discussion on matters climate and how they relate to outcomes. Outcomes, both primary and secondary in our general economy. So it is an area where the school can play a critical role and or can make an enormous contribution.

-Respondent 5.

Enhanced community outreach services present an enormous opportunity for Kenyatta University schools to strengthen the institution's efforts to address the climate crisis. Universities are viewed with high regard across communities due to their ability to

bring positive social change. Thus, the positive perceptions of HEIs mean adequate community support for initiatives implemented by education institutions. HEI-community partnerships will be crucial in implementing climate-resilient projects, reducing communities' vulnerability to climate change extremes. The School of Economics aims to utilise its engagement with the communities to inform them of the importance of participation in decision-making and policy development on climate action. The respondents noted that:

...when we are talking about community outreach, we are looking at opportunities that are there to, to enter into policy dialogue, you know, what research brings evidence, and how do we ensure that the information coming from these researchers actually translate into the policy debate. So there is an opportunity for us to to actively engage in policy dialogue, using evidence from research.

-Respondent 5.

The schools of Education and Medicine aim to strengthen its partnerships and collaborations with communities to support Kenyatta University's climate action. Engaging with the community is likely to yield positive results as the members are well-informed about challenges in their locality. University-community engagement will increase widespread awareness about the importance of shifting to sustainable lifestyles, making people share their resources to transform their locality into healthy and liveable spaces. The respondent highlighted that:

Partnership is first and foremost with the community. I think that's the starting point, to understand the issues that surround climate change... donors support you but not for long. If you can get to involve a community, then you are sure that kind of partnership will continue.

-Respondent 6.

Exploring partnerships with communities is likely to attract more stakeholders from government entities and civil society already engaged in societal transformation agenda to address the climate crisis. A respondent noted that:

Several opportunities exist to engage in enhanced climate action. One of them is working with the disaster management units...the school can be actively involved in providing medical care to communities hit by extremes of climate change. Through its professionals, the school can advise and provide medical care to communities struck by climate change.

-Respondent 12.

The Humanities and Social Sciences School reported that students have opportunities to write story books on climate change issues in simplified form and even using local languages. The books can be sold to school-going children and community members at affordable prices to enhance their climate knowledge. An interviewee from that school also cited opportunities for the dramatisation of climate change content. Moreover, students can be supported to come up with drama, plays, skits and animations or cartoons programme on

climate change. The media resources will play a crucial role in helping the young generations comprehend complex climate change issues in a simplified form. Exposing the youth to such climate information helps raise an environmentally conscious generation.

Respondents from NRF and State Department of University Education and research confirmed that universities have opportunities to engage in climate action through their roles of teaching, research and community engagement. The respondents pinpointed that climate change is a priority area today and most research fund agencies are planning to make it one of the priority areas. The respondent noted that:

It is our wish as an agency funding research that we could strategise and make calls in this area. Universities are already research institutions, being one of their core mandate areas.

-Respondent 14.

Participation of universities in the growing environmentalism and climate action movement presents an opportunity to develop partnerships and collaborations with stakeholders involved in efforts to address the climate crisis. Universities can utilise their community service role to work closely with government institutions, civil society and even individual professionals to institute sustainable development projects in their immediate communities. A respondent pointed out that:

Mainly our work is to coordinate general activities in the university sector. However, we encourage partnerships. For example, the University of Nairobi had partnered with Wangari Mathai Institute to advocate for environmental conservation. We can have similar engagements.

-Respondent 16.

There is an opportunity for universities to solve societal challenges by suggesting policy direction in climate action, mitigation and adaptation at local levels. A respondent from NEMA noted that implementing the Climate Change Act 2016 presents opportunities for HEIs to support national climate action efforts. Full implementation of the Act will lead HEIs to conduct extensive public awareness, training and research on climate change. The study findings will be utilised as a key reference by policymakers to guide the country's development towards a sustainable development pathway. Moreover, public universities are parastatals that are expected to work with the authority to set up climate change units, and implement various initiatives to support climate action efforts.

NEMA respondent indicated that they support the Kenya Universities Green Network (KGUN), which aims to mainstream sustainability aspects into teaching, research, campus operations and student engagement activities. NEMA works closely with other actors through KGUN to foster environmentally-friendly ideas and creative innovations. The respondent added that NEMA supports universities nationwide by offering students attachment and internship opportunities. Students are attached to the climate change department, acquiring well-grounded information on various sustainability issues.



Institutions like KEFRI and KFS provide tree seedlings to the School of Environmental Studies to ensure that the tree nursery at the university has adequate seedlings for carrying out afforestation and reforestation within the campus and in the immediate communities. Furthermore, NRF provides limited funding to support climate-related research projects. The funding plays a significant role in ensuring that researchers engage in well-grounded scientific explorations that inform the university, communities and policymakers on the appropriate strategies for addressing the climate crisis.

8.6 Constraints to University's Effort in Climate Action

Respondents highlighted that their schools and organisations face several challenges hindering their involvement in climate action. Respondents from the schools of Education; Engineering and Technology and Pure Applied Sciences noted that financial constraints prevent them from implementing sustainable projects at the university and community. They noted that despite some schools attempting to develop funding proposals to do research on climate change, they are unsuccessful in securing the funds. A respondent indicated that:

Funding is a big challenge. Most of the research in these areas is capital-intensive. Hence getting adequate funding is a major challenge. There are good proposals written but are not funded.

-Respondent 15.

Respondents who were policy makers from NEMA, NRF and CCD and the State Department of Higher Education also admitted that funding is a serious challenge that prevents collaborative efforts to address climate change. The respondents noted that if HEIs are adequately funded, they will be able to influence policies that will guide relevant climate change agencies. They noted that:

Funding is a serious challenge to universities. Universities must be adequately funded to do more research, especially in the priority areas such as climate change.

-Respondent 16.

Moreover, the funding allocated to research does not correspond with the calls for climate action. Government agencies tasked with disbursing the limited available financial resources to HEIs to undertake research and community service projects tend to overlook topics on climate change. Thus, the institution's operations in climate actions are either delayed or completely halted due to financial constraints. A respondent noted that:

There has been laxity in allocating funds to climate change activities such as research, training and practical climate change adaptation and mitigation.

-Respondent 13.

On the one hand, most schools reported that they lack staff who are well conversant with climate change. The lack of climate change experts prevents the schools from imparting adequate knowledge

on climate change to the students, and implementing mitigation and adaptation measures. One respondent stated that:

We would want to have the experts in climate change coming over to give talks to our students and staff. So that's also another challenge that we say we could be facing. We would need climate change experts.

-Respondent 7.

The study findings indicate that faculty in most schools at Kenyatta University have a considerable workload. The busy schedules of the course instructors hinder them from engaging in informal and non-formal activities that can assist students in acquiring CCE. Non-engagement of faculty in student-led activities that advocate for climate action lowers the morale of the students causing a small number of learners to participate in initiatives to address the climate crisis. In addition, the NRF's respondent pointed out that university staff are unable to engage in climate-related research due to the immense workload. The respondent highlighted that:

Quite a number of people are busy doing their own things and to get them to commit their time to these climate action activities is difficult. We have other activities that we must do where we are employed to work.

-Respondent 6.

Faculty members regard departmental duties of teaching and research tied to their disciplines as primary and allocate most of their time to complete them. Activities or initiatives that address the climate crisis, including training and greening activities, are viewed as secondary duties that most faculty members spend little time undertaking. One respondent indicated that:

We actually have four people who have done environmental law, two at PhD level, two at the masters level. So they must be very good at it. But the problem is the amount of time involved in working with students on climate change matters, those lecturers may not be willing to commit.

-Respondent 11.

Similarly, due to the heavy teaching workload, most faculty members shy away from or locate minimal time to engage in climate change research that falls outside their departmental mandate and responsibilities. A respondent noted that:

Amount of time allocated for research is very little. Faculty members are not engaging in research because of the workload. We need to set aside about 30% of staff time to research.

-Respondent 14.

Some schools cited challenges reviewing courses to mainstream sustainable development issues. Reviewing the courses is a complex process due to Commission of University Education regulations that

must be adhered to ensure approval. Therefore, schools shy away from revising their courses, which hinders the integration of climate change content. A respondent stated that:

There is a lot of bureaucracy in getting approval for new courses/programmes. The Commission for University Education is very keen on sustainability aspects in these courses/programmes but the process is quite laborious. So we keep postponing the exercise.

-Respondent 9.

University-community engagement to strengthen climate action is faced with challenges leading to failure to achieve the set targets. One of the major constraints is negative perceptions among community members. Most community members view universities' outreach services as avenues for financial assistance. The respondent from the school of Education pinpointed that there is decreased community ownership and support for CSR activities due to failure to provide financial assistance during their engagement with communities. The respondent from the School of Education noted that:

Once community members see staff from the university, they expect some financial assistance which is a culture that should be discouraged. You can't just engage them and then leave without leaving something behind otherwise they will not implement what you have discussed.

-Respondent 6.

Donor interests affect collaborative efforts toward climate action. Priority areas highly determine funding from donors and international organisations. The respondent from the hospitality, tourism and leisure studies pointed out that the priority areas receiving massive funding currently is the health sector to minimise the spread of diseases such as COVID-19. Failure of donors to recognise climate action as a priority area that requires substantial funding leads to the low implementation of climate action initiatives.

Poor coordination between schools at Kenyatta University is a major hindrance in implementing climate action initiatives. Respondents from within Kenyatta University pointed out that schools perform their duties in isolation while adhering to the university policy. However, the schools fail to institute internal collaborations to support climate action efforts. One respondent said that:

The biggest challenge is poor coordination among schools in KU in fighting climate change. For instance, there are so many clubs in KU founded with the aim of fighting negative environmental problems. The problem is coordination.

-Respondent 2.

A respondent from NEMA stated that poor internal coordination leads to low mobilisation of resources to support climate action. Poor coordination hampers the universities management to recognise that students are a valuable human workforce and hold insightful

information to address climate change challenges. The respondent noted that universities do not have strategies on climate action, failing to take advantage of the student population at their disposal.

Generally, a number of schools reported that they do not receive financial, policy, regulatory, technical or any other government support in climate action and sustainable development. The lack of government support for most schools may indicate a disjointed relationship between higher education institutions and government entities to collaborate or partner to institute effective climate action projects. In addition, the lack of government support for the university limits the involvement of skilled academic professionals that can play a significant role in identifying and designing sustainable measures to address climate change. Schools also experience challenges implementing projects that support the university's climate action efforts. Climate action efforts are costly and complex and may require government institutions' support. Failure to provide adequate support to universities negatively affects the national call for collaborations and partnerships to solve the climate crisis.

Conclusion

It is no doubt that communities in Kenya like most parts of the world have begun to experience increased challenges of climate change, such as droughts, heatwaves, and rising sea levels. Efforts to address climate change call for collaborations and partnerships from communities, HEIs, government, civil society and the international community. Teaching, research and community engagement roles allow HEIs to participate in climate action initiatives. This study aimed to assess the extent of climate change coverage in Kenyatta University's curriculum, campus activities and community engagement operations. Opportunities and challenges the university faces in climate action were examined. The themes emerging from the thematic analysis included integrating climate change content, campus greening activities, partnerships and collaborations, institutional policies on climate action, and opportunities and constraints for the university to contribute to climate action.

The study established that various schools and departments at Kenyatta University regard integrating climate change content into their courses as an ideal opportunity to strengthen their involvement in climate action. The study findings show that offering courses and programmes on climate change helps the schools play a significant role in increasing climate literacy among the students and communities. Greening the curriculum presents an opportunity for the universities to institute collaborations with various stakeholders in a model that would involve students, community members and professionals from the private and public sectors to design climate change curricula. There is evidence that the university collaborates and partners with local, regional and international organisations in relation to further strengthening teaching, research and community engagement to address the climate crisis. Given the current focus on climate action at the national and internal levels, nurturing these collaborations will likely lead to long-term working relations that may strengthen the sharing of resources and knowledge on climate change mitigation and adaptation initiatives. Moreover, expanding



research by university students and staff through the collaborations presents an opportunity to generate well-grounded data that will guide policymakers in formulating policies to guide mitigation and adaptation.

The university schools which took part in this study show some level of engagement in greening activities as well to strengthen national environmental conservation efforts and address the climate crisis. The greening activities are carried out within the university, its campuses, and communities across the country. Some greening activities involve large-scale collaborations between schools and private and public organisations. In some cases, these efforts are spearheaded by students' clubs. Popular activities by the students include tree planting, waste management practices, clean-ups, climate awareness, and activism. These activities provide the students with hands-on experience in implementing initiatives to address climate change.

Despite the university strengthening its involvement in climate action in the recent past, there exists a number of constraints that limit the university's full involvement. For instance, not all of the university schools and departments are able to fully integrate climate change content. The course instructors in most schools have huge workloads that prevent them from participating in climate action and related activities. Other study respondents reported capacity challenges as most faculty do not have sufficient knowledge on the subject. The lack of climate change experts spread across university schools and departments mean that students in some departments cannot not get exposure to climate change content. Bureaucratic challenges that restrict multidisciplinary course approvals was also cited as one of the main constraints. Furthermore, limited financial resources hinder schools at Kenyatta University from implementing climate change mitigation and adaptation initiatives. Important to note that inadequate funding mainly affects research activities on climate change in Kenya. Limited research by Kenyan and generally African higher education on climate change means that the impacts affecting local communities are not documented. This consequently impacts reference to local content in teaching and learning. However, the existing and available opportunities to institute new internal and external collaborations to develop courses on climate change, expand research and enhance student and community engagement in climate action would lead to increased implementation of sustainable development projects if explored.

Given the importance of their functions, universities need to reform their existing teaching, research and community service to go beyond business as usual operations. Universities ought to adopt new frameworks and approaches that uphold education for sustainable development and climate change education. Targeted dissemination of knowledge has the potential to help communities to better address the challenges of climate change, and align their development efforts to sustainable development efforts. Exposing learners to programmes and courses focusing on sustainable development and climate change education will develop cross-cutting skills, values, mindsets and competencies to participate in climate action initiatives. Establishing new or reviewing existing courses to integrate climate change content and corresponding delivery approaches will help prepare learners and facilitators for the current climate challenges

while equipping them with tools to co-create appropriate solutions. An initiative like the Kenyatta University Growing Leaders Programme that is now mainstreaming climate change content and with capacity to reach all or majority of students is ideal for impact.

Green universities' curricula that expose learners to sustainable development and climate change education need to be underpinned by relevant research. Therefore, HEIs across the continent must expand their research on climate change challenges facing various communities and contribute to generating teaching and learning resources, and contact specific solutions. Climate research is a great opportunity for faculty members and learners to enhance the increasing efforts by governments and business sector to address the climate crisis. Publications and research activities on the climate crisis, if strengthened, will promote the connectedness between academia, civil society groups and policymakers to engage in broader groundwork on climate change. The collaborations will lead to new knowledge, and to promote technological innovations that can support local mitigations and adaptations to climate change.

Involving the students in research and co-creation of knowledge like the case of Kenyatta University Green Education Hub also presents a unique opportunity for scale and impact. Efforts involving students not only enhance university effort in climate action but also bring in the energy and innovation of youths in addressing climate action more sustainably.



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About Transforming Universities for a Changing Climate

Climate change is the most significant global challenge of our time, and many of its effects are felt most strongly in the poorest communities of the world. Higher education has a crucial role to play in responding to the climate crisis, not only in conducting research, but also through teaching, community engagement and public awareness. This study contributes to our understanding of how universities in low and middle-income countries can enhance their capacity for responding to climate change, through a focus on the cases of Brazil, Fiji, Kenya and Mozambique. In doing so, it contributes to the broader task of understanding the role of education in achieving the full set of Sustainable Development Goals.

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